WHAT IS CLAIMED IS

1. A reduction resistant thermistor comprised of a sintered body of a metal oxide obtained by shaping and firing a thermistor material including the metal oxide, having a mean particle size of the thermistor material of less than 1.0 μm, and having a mean sintered particle size of the sintered body of the metal oxide of 3 μm to 20 μm, wherein the sintered body of the metal oxide is a mixed sintered body $(M1\ M2)O_3 \cdot AO_x$ of a composite oxide expressed by $(M1\ M2)O_3$ and a metal oxide expressed by AO_x, wherein, in the composite oxide $(M1\ M2)O_3$, M1 is at least one type of element selected from elements of Group IIA of the Periodic Table and Group IIIA except for La and M2 is at least one type of element selected from elements of Group IIIB, Group IVA, Group VA, Group VIA, Group VIIA, and Group VIII of the Periodic Table, the metal oxide AO_x has a melting point of at least 1400°C, and the resistance (1000°C) of the AO_x alone in the shape of the thermistor is at least 1000Ω.

2. A reduction resistant thermistor as set forth in claim 1, wherein when the molar fraction of the composite oxide $(M1\ M2)O_3$ in the mixed sintered body is a and the molar fraction of the metal oxide AO_x is b, a and b satisfy the relations $0.05 \leq a < 1$, $0 < b \leq 0.95$, and $a+b=1$.

3. A reduction resistant thermistor as set forth in any one of claim 1, wherein M1 in the composite oxide $(M1\ M2)O_3$ is at least one type of element selected from Mg, Ca, Sr, Ba, Y, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Yb, and Sc and M2 is at least one type of element selected from Al, Ga, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Tc, Re, Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, and Pt.

4. A reduction resistant thermistor as set forth in claim 1, wherein A in the metal oxide AO_x is at least one element selected from B, Mg, Al, Si, Ca, Sc, Ti, Cr, Mn, Fe, Ni, Zn, Ga, Ge, Sr, Y, Zr, Nb, Sn, Ce, Pr, Nd,

Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Hf, and Ta.

5. A reduction resistant thermistor as set forth in claim 1, wherein the metal oxide AO_x is at least one metal oxide selected from MgO, Al_2O_3, SiO_2, Sc_2O_3, TiO_2, Cr_2O_3, MnO, Mn_2O_3, Fe_2O_3, Fe_3O_4, NiO, ZnO, Ga_2O_3, Y_2O_3, ZrO_2, Nb_2O_5, SnO_2, CeO_2, Pr_2O_3, Nd_2O_3, Sm_2O_3, Eu_2O, Gd_2O_3, Tb_2O_3, Dy_2O_3, Ho_2O_3, Er_2O_3, Tm_2O_3, Yb_2O_3, Lu_2O_3, HfO_3, Ta_2O_5, $2MgO \cdot 2SiO_2$, $MgSiO_2$, $MgCr_2O_4$, $MgAl_2O_4$, $CaSiO_3$, $YAlO_3$, $Y_3Al_5O_{12}$, Y_2SiO_5, and $3Al_2O_3 \cdot 2SiO_2$.

6. A reduction resistant thermistor as set forth in claim 1, wherein M1 in the composite oxide (M1 M2) O_3 is Y, M2 is Cr and Mn, <u>A</u> in the metal oxide AO_x is Y, and the mixed sintered body $(M1\ M2)O_3 \cdot AO_x$ is expressed by $Y(CrMn)O_3 \cdot Y_2O_3$.

7. A reduction resistant thermistor as set forth in claim 1, including at least one of CaO, $CaCO_3$, SiO_2, and $CaSiO_3$ as a sintering aid.

8. A method of production of a thermistor comprised of a sintered body of a metal oxide including a plurality of metal elements, comprising the steps of:

using powders of compounds of the plurality of metal elements as starting materials and mixing and pulverizing the powders to obtain a mixture having a mean particle size of less than 1.0 μm,

heat treating the mixture, then pulverizing it to obtain a thermistor material having a mean particle size of less than 1.0 μm, and

shaping the thermistor material into a predetermined shape and firing it to obtain a sintered body having a mean sintered particle size of 3 μm to 20 μm.

9. A method of production of a thermistor comprised of a sintered body of a metal oxide including a plurality of metal elements, comprising the steps of:

using ultrafine particles or sol particles of compounds of the plurality of metal elements having

mean particle sizes of not more than 0.1 μm as starting materials and mixing and pulverizing the ultrafine particles or sol particles to obtain a mixture having a mean particle size of less than 1.0 μm,

heat treating the mixture, then pulverizing it to obtain a thermistor material having a mean particle size of less than 1.0 μm, and

shaping the thermistor material into a predetermined shape and firing it to obtain a sintered body having a mean sintered particle size of 3 μm to 20 μm.

10. A method of production of a thermistor comprised of a sintered body of a metal oxide, comprising the steps of:

preparing a precursor solution containing a precursor compound of the metal oxide,

heat treating the precursor solution to obtain a thermistor material having a mean particle size of less than 1.0 μm, and

shaping the thermistor material into a predetermined shape and firing it to obtain a sintered body having a mean sintered particle size of 3 μm to 20 μm.

11. A method of production of a thermistor comprised of a sintered body of a metal oxide, comprising the steps of:

preparing a precursor solution containing a precursor compound of the metal oxide,

adding and mixing ultrafine particles including the metal and having a mean particle size of not more than 0.1 μm into the precursor solution to prepare a precursor solution in which the ultrafine particles or sol particles are dispersed,

heat treating the precursor solution in

which the ultrafine particles or sol particles are dispersed to obtain a thermistor material having a mean particle size of less than 1.0 μm, and

shaping the thermistor material into a predetermined shape and firing it to obtain a sintered body having a mean sintered particle size of 3 μm to 20 μm.

12. A method of production of a thermistor comprised of a mixed sintered body $(M1\ M2)O_3 \cdot AO_x$ of a plurality of metal oxides, comprising the steps of:

preparing a first precursor solution containing a precursor compound of $(M1\ M2)O_3$,

preparing a second precursor solution containing a precursor compound of AO_x,

heat treating the first precursor solution to obtain a first thermistor material having a mean particle size of less than 1.0 μm,

heat treating the second precursor solution to obtain a second thermistor material having a mean particle size of less than 1.0 μm, and

mixing the first and second thermistor materials, shaping the mixture into a predetermined shape, and firing it to obtain a sintered body having a mean sintered particle size of 3 μm to 20 μm.

13. A temperature sensor comprised of a reduction resistant thermistor as set forth in claim 1.